

(19)  **Europäisches Patentamt**  
**European Patent Office**  
**Office européen des brevets**



(11) **EP 1 177 799 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication: (51) Int Cl.<sup>7</sup>: A61L 9/04, A61L 9/12  
 2/6/2002 **Bulletin 2002/06**  
 (21) File number: **01118422.3**  
 (22) Date of filing: **8/31/2001**

(84) Designated contracting countries:  
**AT BE CH CY DE DK ES FI FR GB**  
**GR IE IT LI LU MC NL PT SE TR**  
 Designated extension countries:  
**AL LT LV MK RO SI**

(72) Inventors:

- **Wendel, Herbert**  
**57230 Eguelshardt (FR)**
- **Wendel, Serge**  
**68340 Riquewihr (FR)**

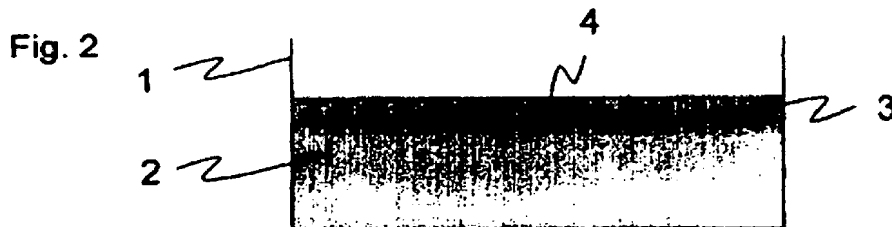
(30) Priority: 7/1/2000 **FR 0010175**

(74) Representative: **Vièl, Christof**  
**Cabinet Vièl 1, rue des Bleuets, BP 18**  
**57520 Grosbliederstroff (FR)**

(71) Applicant: **Manka Création SARL**  
**57520 Saint-Avoid (FR)**

(54) **Atomizer for vaporizable products**

(57) The invention concerns an atomizer for vaporizable products comprising a receptacle (1) containing the product(s) that are to be evaporated, included in a gel (2), as well as an evaporation device (3) held at the evaporation surface of the gel (2) to constrain it to maintain a practically constant evaporation surface regardless of the level of evaporation of the vaporizable product(s), the evaporation device (3) being mobile with respect to the receptacle (1). This evaporation device (3) may specifically consist of a plate provided with several openings (4) into which the gel (2) penetrates. During evaporation, points are formed on the evaporation surface which attach to the openings (4), thus constraining the gel (2) to maintain its initial evaporation surface. The disappearance of the material is therefore manifested only by a decrease of the thickness of the gel mass. A particular embodiment of the evaporation device (3) is realized by soldering small tubes to one another on their walls.



## Specification

[0001] The invention concerns an atomizer for vaporizable products, comprising a receptacle containing the product(s) that are to be evaporated, included in a gel, as well as an evaporation device kept at the evaporation surface of the gel to constrain it to maintain a practically constant evaporation surface regardless of the level of evaporation of the vaporizable product(s).

[0002] The atomizers of vaporizable products are currently used for perfuming or purifying the air of a room, a vehicle or a cupboard. In general, the vaporizable product consists of water to which a gelling product is added to facilitate the handling of the atomizer and to avoid spilling the product in case the receptacle is turned upside-down. The vaporizable product frequently contains a perfume as well as an odor-destroying substance, the purpose of which is to absorb and neutralize odorous particles suspended in air. Currently the mixture is dyed with a color that is reminiscent of the perfume used.

[0003] The disadvantage of these perfume atomizers or odor destroyers resides in the fact that during the evaporation of the vaporizable product, notably water, the gel curls up on itself, so that the evaporation surface diminishes considerably. This results in a notable decrease of the efficacy of the diffusion of the perfume or of the odor absorber. Moreover, the agglomerate which forms has an unattractive appearance, which makes its usage unpleasant in a visible area.

[0004] Several solutions were proposed to solve this problem. From US 5,060,858, an atomizer for vaporizable products is known, the receptacle of which is equipped at the periphery of its opening with anchoring devices formed either by a porous material or by notches. Since the gel is partially absorbed by the porous material or penetrates into the notches, it is supposed to have a stable evaporation surface all during the evaporation. Since this evaporation surface always remains near the opening of the receptacle, the gel, while retracting, rises in the container.

[0005] A variation of anchoring the gel near the opening of the receptacle is known from US 6,039,266. Here the anchoring device consists of a grid, attached to the periphery of the opening of the receptacle. During manufacture, the grid is immersed into the surface layer of the gel so that it is covered with a layer sufficient to ensure anchoring. The evaporation surface being anchored on the grid, which is itself attached to the periphery

of the opening of the receptacle, the mass of the gel rises in the receptacle during evaporation.

[0006] These devices have two major disadvantages. They can only be used with gels, the composition of which permits retraction upward. As a matter of fact, if the mechanical properties of the gel are insufficient, the mass of the gel might dislocate under its own weight so that only a very small part of the gel remains effectively anchored at the anchoring device, while the rest of the mass remains at the bottom of the receptacle. When the upper part is evaporated, it forms a kind of crust which interferes considerably with the evaporation of the block of gel that remains on the bottom of the container.

[0007] The realization of the anchoring is a second problem for this type of atomizer. As a matter of fact, the weight of the mass of the gel is relatively large in comparison to the available anchoring surface. Thus, it is necessary that the layer covering the grid be sufficient to assure anchoring, without the entire mass remaining at the bottom of the receptacle and only the grid remaining at the opening.

[0008] Moreover, to assure the formation of this surface layer, it is necessary first of all to attach the grid at the main opening of the container, to close this opening with a cover and to turn the entire system upside-down to fill the container through a filling opening formed for this purpose in the bottom of the container, and finally to close this filling opening with a tight stopper. Therefore, this method requires numerous pieces, adapted well to one another so that there will be no leaks.

[0009] The objective of the invention is therefore to develop an atomizer for a vaporizable product that permits homogeneous evaporation of the vaporizable product(s) all during the utilization, regardless of the type of gel used. The evaporation device should guarantee that the mass does not become dislodged and that the evaporation surface of the gel always remains in contact with the evaporation device. A second objective of the invention is to obtain an atomizer which requires few pieces and which can be produced at a low cost.

[0010] This objective is realized with an atomizer according to the preamble in which the vaporizing device is mobile with respect to the receptacle. Consequently, during evaporation, the gel retracts, entraining the evaporation device. The mass of the gel

always remains at the bottom of the receptacle therefore there is no risk of dislodging. Moreover, there is no longer any risk of "de-anchoring". The evaporation device is placed and kept at the evaporation surface of the gel during the entire evaporation of the vaporizable product(s). Thus, retraction of the gel under the effect of the evaporation of the vaporizable product(s), being accompanied by a decrease of the evaporation surface, is avoided. By preventing the gel from curling up into unappealing agglomerate, the gel maintains an aesthetic appearance which is more favorable than the current usage. Moreover, during manufacture, it is sufficient to pour the gel into the receptacle, to place the grid at the surface and to immerse it into the surface layer so that it would appear on the surface. The cost of production of such an atomizer is very much lower than for the atomizers of the prior art. Moreover, advancement of the evaporation of the gel can be monitored better.

[0011] This evaporation device may consist of a plate that has several openings. This plate preferably has an open alveolar structure, formed, for example, by a multitude of small tubes that are open at their two ends and are soldered to one another at their walls. Thus, the gel penetrates into the openings of the plate which forms a kind of relatively rigid grid so that, as the evaporation of the vaporizable products progresses, the gel retracts in height while a constant evaporation surface is preserved, due to the upholding imposed by the openings of the evaporation device.

[0012] According to the invention, the gel containing the vaporizable products also has one or more odorous substances and/or one or more products which are odor destroyers and/or a dye. The vaporizable product(s) are preferably water. The atomizer of the vaporizable products according to the invention is particularly adapted to the atomization of perfume or odor destroyers.

[0013] A preferred practical example of the invention is presented below.

- Figure 1 shows a schematic view from the top of an atomizer according to the invention;
- Figure 2 shows a schematic view in cross-section of the atomizer of Figure 1 at the beginning of utilization;
- Figure 3 shows a schematic view in cross-section of the atomizer of Figure 1 at the end of utilization;

Figure 4 shows schematically a cross-sectional view of a classical atomizer not equipped with an evaporation device according to the invention, at the end of utilization.

[0014] The atomizer of vaporizable products according to the invention consists of a receptacle (1), in general, a circular dish that can be closed with a cover which is not shown, into which the gel (2) containing the vaporizable products, the odorous products and the odor destroyers are placed. An evaporation device (3) is placed on the evaporation surface of the gel. This evaporation device has the function of constraining the evaporation surface of the gel (2) to remain practically constant in spite of the evaporation of the vaporizable products.

[0015] An embodiment of the evaporation device (3) involves using a plate having several openings. As the gel penetrates into the openings, points are formed on the evaporation surface during the evaporation which attach to the openings, constraining, in this way, the gel to maintain its initial evaporation surface. The disappearance of the material is then manifested only by a decrease of the thickness of the gel mass.

[0016] To be effective, the plate should have a sufficient rigidity to resist the retraction forces of the gel. In order to assure good evaporation of the vaporizable products, preferably the total surface of the openings is as close as possible to the potential evaporation surface. In other words, it is necessary that the plate forming the evaporation device should have only a very low intrinsic surface. This is obtained by giving the plate an open alveolar structure. The alveoles, which are open on both sides, form a sort of a grid. The gel penetrating into all the alveoles forms the evaporation surface which is only slightly smaller than the evaporation surface that the gel would have in the absence of the evaporation device. This alveolar structure can be obtained easily by soldering small tubes to one another to form a grid as shown in Figure 1. For example, one could use tubes made of plastic material with a diameter of approximately 5.9 mm and a height of 5 mm, soldered to one another on their walls. While this solution is very efficient, it does not significantly increase the manufacturing cost of the atomizer.

[0017] By varying the rigidity of the evaporation device, it is possible to preserve the shape of the initial evaporation surface regardless of whether it is plane or curved, or, on the contrary, to permit a certain bending of it, as shown in Figure 3. This modification of

## **EP 1 177 799 A1**

the geometry of the evaporation surface has, however, practically no effect on the total evaporation surface which remains essentially constant.

**[0018]** The shape of the receptacle is of no importance. It is sufficient that the evaporation devices would have the possibility to remain in contact with the evaporation surface of the gel by freely following the vertical retraction movement of the gel during evaporation. Similarly, the shape of the evaporation device can be chosen freely. Preferably it involves the approximate dimensions of the horizontal cross-section of the receptacle. The shape of the alveoles can also be freely chosen.

**[0019]** The addition of a dye to the mass of the gel may add an aesthetic touch which can be improved further by dyeing the evaporation device and the receptacle in coordinated colors.

**[0020]** In the absence of a evaporation device, the gel mass retracts on all sides to end up as an agglomerate represented schematically in Figure 4, the aesthetic appearance of which is a major handicap to its marketing. Moreover, since the evaporation surface decreases continuously during usage, its effect diminishes over the course of time.

**[0021]** With the aid of the evaporation device according to the invention, all these disadvantages can be avoided by constraining the gel to maintain approximately its initial evaporation surface. Moreover, during evaporation gradually a sort of checkerboard pattern or a structure reminiscent of lace of a beehive is formed, which is much more elegant than the classical agglomerate. By following the vertical retraction movement of the gel mass, there is no risk of the gel mass being dislodged or becoming separated from the evaporation device.

**[0022]** The method of manufacture of the atomizer is much simpler than that of the prior art. It is sufficient to fill the receptacle with gel, to place the grid on the surface and to make it penetrate into the surface layer, so that it will show through the surface there.

**[0023]** The atomizer according to the invention is therefore more effective than the atomizers of the prior art. It can be used with any type of gel. It is easy to produce and requires only a few pieces, which makes it particularly economical.

**Patent Claims**

1. Atomizer for vaporizable products comprising a receptacle (1) containing the product(s) that have to be evaporated included in a gel (2) as well as an evaporation device (3) kept at the evaporation surface of the gel (2) to constrain it to maintain an evaporation surface which is practically constant regardless of the level of evaporation of the vaporizable product(s), **characterized by the fact that** the evaporation device (3) is mobile with respect to the receptacle (1).
2. Atomizer for vaporizable products according to Claim 1, **characterized by the fact that** the evaporation device (3) consists of a plate having several openings (4).
3. Atomizer for vaporizable products according to the preceding claim, **characterized by the fact that** the plate (3) having several openings (4) has an open alveolar structure.
4. Atomizer for vaporizable products according to the preceding claim, **characterized by the fact that** the open alveolar structure is formed by a multitude of small tubes open at both ends and soldered to one another at their walls.
5. Atomizer for vaporizable products according to one of the preceding claims, **characterized by the fact that** the gel (2) comprises one or several odorous substances and/or one or several odor-destroying products and/or a dye.
6. Atomizer for vaporizable products according to one of the preceding claims, **characterized by the fact that** one of the vaporizable product(s) is water.

Fig. 1

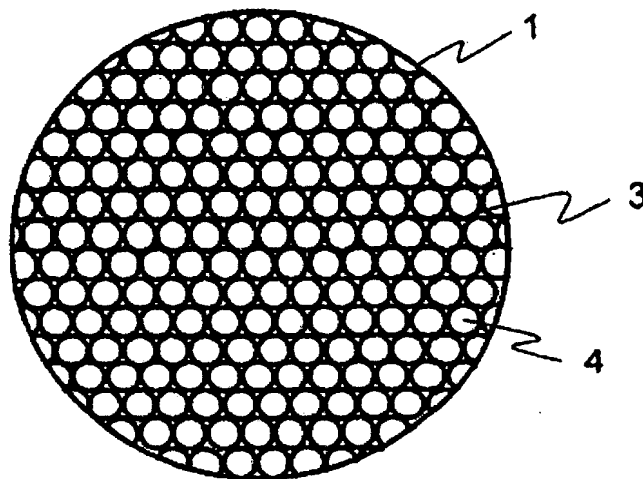


Fig. 2

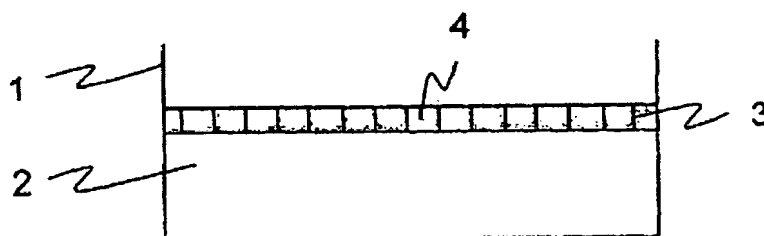


Fig. 3

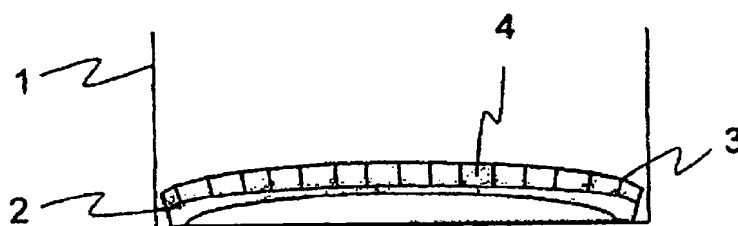


Fig. 4

